

0070028

SAF-RC-032
100-F Remaining Sites Burial Grounds -
Soil Full Protocol
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan (2) H9-02

mjl 5/23/06
INITIAL DATE

COMMENTS:

SDG K0228

SAF-RC-032

RECEIVED
JUN 22 2006
EDMC

Waste Site: 116-F-16

Date: 1 May 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol - Waste
Site 116-F-8 & 116-F-16
Subject: Metals - Data Package No. K0228-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0228 prepared by Eberline Services (EB). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Data
J118J1	2/15/06	Soil	C	See note 1
J117N8	2/15/06	Soil	C	See note 1
J117N9	2/15/06	Soil	C	See note 1
J117P0	2/15/06	Soil	C	See note 1
J117P1	2/15/06	Soil	C	See note 1
J117P2	2/15/06	Soil	C	See note 1

1 - ICP metals by 6010B (lead).

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 6 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation
- Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

• Holding Times

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 28 days for ICP metals.

All holding times were acceptable.

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• Preparation (Method) Blanks

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the contract required detection limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the instrument detection limit (IDL) and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

All preparation blank results were acceptable.

Field (Equipment) Blank

One equipment blank (J118J1) were submitted for analysis. No analytes were detected in the equipment blank.

• Accuracy

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All accuracy results were acceptable.

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- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

One sets of field duplicates (J117N8/J117P2) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicates were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area RQLs to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

- **Completeness**

Data package No. K0228 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

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REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1
Glossary of Data Reporting Qualifiers

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Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

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METALS DATA QUALIFICATION SUMMARY*

SDG: K0228	REVIEWER: TLI	PROJECT: 116-F-8 & 116-F-16	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned			

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

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Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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Project: WASHINGTON CLOSURE HANFORD													
Lab: LLI		SDG: K0228											
Sample Number		J117N8		J117N9		J117P0		J117P1		J117P2		J118J1	
Remarks								Duplicate		E. Blank			
Sample Date		2/15/06		2/15/06		2/15/06		2/15/06		2/15/06		2/15/06	
Inorganics	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Lead	5	3.4		5.3		3.5		3.9		3.4		0.30	U

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 03/10/06

CLIENT: TNUHANFORD RC-032 K0228
WORK ORDER: 11243-606-001-9999-00

LVL LOT #: 0602L300

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J118J1	Lead, Total	0.30	MG/KG	0.30	1.0
-002	J117N8	Lead, Total	3.4	MG/KG	0.93	3.0
-003	J117N9	Lead, Total	5.3	MG/KG	0.92	3.0
-004	J117P0	Lead, Total	3.5	MG/KG	0.96	3.0
-005	J117P1	Lead, Total	3.9	MG/KG	0.93	3.0
-006	J117P2	Lead, Total	3.4	MG/KG	0.89	3.0

Handwritten:
R
4/30/06

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation



Analytical Report

Client: TNU-HANFORD RC-032
LVL#: 0602L300
SDG/SAF#: K0228/RC-032

W.O.#: 11343-606-001-9999-00
Date Received: 02-17-06

METALS CASE NARRATIVE

1. This narrative covers the analyses of 6 soil samples.
2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary. All samples except J118J1 were reported with 3-fold dilutions due to sample matrix.
3. All analyses were performed within the required holding times.
4. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
7. The preparation/method blank (MB) was within method criteria {less than the Practical Quantitation Limit (3X the IDL), or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.
8. All ICP Interference Check Standards were within control limits.
9. The laboratory control sample (LCS) was within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.
10. The matrix spike (MS) recovery was within the 75-125% control limits. Refer to the Inorganics Accuracy Report.
11. The duplicate analysis was within the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.
12. For the purposes of this report, the data has been reported to the Instrument Detection Limit

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 14 pages.

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(IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

13. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
14. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.


Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

3/13/04
Date

jjw/m02-300



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Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-032-014		Page 1 of 1			
Collector Coffman/Stankovich		Company Contact R.T. Coffman		Telephone No. 528-6409		Project Coordinator KESSNER, JH		Price Code 8C Data Turnaround 21 days			
Project Designation 100-F Remaining Sites Burial Grounds - Soil Full Protocol		Sampling Location 116-F-16 Deep <i>Shallow</i> <i>no</i> <i>2-8-06</i>		SAF No. RC-032		Air Quality <input type="checkbox"/>					
Ice Chest No. <i>ERC-03-103</i>		Field Logbook No. EFL-1174		COA R16F162000		Method of Shipment FedEx					
Shipped To EDERLINE SERVICES LIONVILLE		Offsite Property No. <i>A060290</i>		Bill of Lading/Air Bill No. <i>See OSPC</i>							
POSSIBLE SAMPLE HAZARDS/REMARKS <i>NA < DOT Limits</i> Special Handling and/or Storage <i>at 4 degrees C</i>				Preservation		None	Cool 4C	None	None	None	
				Type of Container		G/P	G/P	G/P	G/P	G/P	
				No. of Container(s)		1	1	1	1	1	
				Volume		250g	60mL	500mL	60mL	60mL	
SAMPLE ANALYSIS <div style="writing-mode: vertical-rl; transform: rotate(180deg); position: absolute; left: -50px; top: 0;">000015</div>				See item (1) in Special Instructions.	Chromium Hex - 7196	See item (2) in Special Instructions.	 Niobium, Strontium, 89,90 - Tellurium, Sr <i>ms</i> <i>2/16/06</i> 	Isotopic Plutonium			
Sample No.	Matrix *	Sample Date	Sample Time								
J117N8	SOIL	2-15-08	0815	X	X						
J117N9	SOIL	2-15-08	0830	X	X						
J117P0	SOIL	2-15-08	0840	X	X						
J117P1	SOIL	2-15-08	0850	X	X						
J117P2	SOIL	2-15-08	0815	X	X						
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				Matrix *			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		(1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Bismuth, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7470 - (CV) (2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Silver-108 metastable) Personnel not available to relinquish samples from 3728 Ref # 2C on 2/16/06			
<i>R.T. Coffman</i>		1430		<i>3728/2C</i>		2/15/06 1430					
<i>3728/2C</i>		2-16-06 1130		<i>R.T. Coffman</i>		2-16-06 1130					
<i>R.T. Coffman</i>		2-16-06 1600		<i>Fed Ex</i>							
<i>Fed Ex</i>		2-17-06 10920		<i>D. J. [unclear]</i>		2-17-06 10920					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
LABORATORY SECTION		Received By		Title		Date/Time					
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time					

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-032-022		Page 1 of 1	
Collector Coffman/Stankovich		Company Contact R.T. Coffman		Telephone No. 528-6409		Project Coordinator KESSNER, JH		Price Code 8C Data Turnaround 21 days	
Project Designation 100-F Remaining Sites Burial Grounds - Soil Full Protocol		Sampling Location 116-F-16 Shallow		SAF No. RC-032		Air Quality <input type="checkbox"/>			
Ice Chest No. ERC-03-103		Field Logbook No. EFL-1174		COA R16F162000		Method of Shipment Fed Ex			
Shipped To EBERLINE SERVICES / LIONVILLE		Offsite Property No. A060290		Bill of Lading/Air Bill No. See OSPC					
POSSIBLE SAMPLE HAZARDS/REMARKS NA < POT Limits Special Handling and/or Storage Cool 4 degrees C		Preservation		None	Cool 4C	None	None	None	
		Type of Container		G/P	G/P	G/P	G/P	G/P	
		No. of Container(s)		1	1	1	1	1	
		Volume		250g	60mL	500mL	60mL	60mL	
SAMPLE ANALYSIS 0000016		See item (1) in Special Instructions.		Chromium Hex. - 7196	See item (2) in Special Instructions.	Nickel-63, Strontium-89,90 -- Total Sr	Isotopic Plutonium		
Sample No.	Matrix *	Sample Date	Sample Time						
J118J1	SOIL	2-15-06	745	X	X				
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		SPECIAL INSTRUCTIONS <u>wa 2/15/06</u> (1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc), Mercury - 7478 - (CV) (2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Silver-108 metastable) Personnel not available to Relinquish samples from 3728 Ref # <u>2C</u> on <u>2/16/06</u>	
3728/2C <u>not touched</u>		<u>2/15/06</u>		<u>3728/2C</u>		<u>2/15/06 1430</u>			
<u>3728/2C</u>		<u>2-16-06 1120</u>		<u>R2 Steffler R2 Steffler</u>		<u>2-16-06</u>			
<u>R2 Steffler R2 Steffler</u>		<u>2-16-06</u>		<u>Fed Ex</u>		<u>2-16-06</u>			
<u>Rel Ex</u>		<u>2-17-06 10920</u>		<u>W. J. Smith</u>		<u>2-17-06 10920</u>			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		Matrix * S=Soil SL=Solvent SO=Solid SL=Sludge W=Water O=Oil A=Air DS=Dry Solids DL=Dry Liquid T=Tissue WI=Wipe L=Liquid V=Vegetation X=Other	
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
LABORATORY SECTION		Received By		Title		Date/Time			
FINAL SAMPLE DISPOSITION		Disposed Method		Disposed By		Date/Time			

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	116-F-8/14		DATA PACKAGE: K0228		
VALIDATOR:	TLJ	LAB:	LLI	DATE: 4/28/06	
			SDG:	K0228	
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
J11751 J11708 J11709 J11720					
J117P1 J117P2					
Soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes **No** N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? Yes **No** N/AInitial calibrations acceptable? Yes **No** N/AICP interference checks acceptable? Yes **No** N/AICV and CCV checks performed on all instruments? Yes **No** N/AICV and CCV checks acceptable? Yes **No** N/AStandards traceable? Yes **No** N/AStandards expired? Yes **No** N/ACalculation check acceptable? Yes **No** N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E)	Yes	No	N/A
ICB and CCB results acceptable? (Levels D, E)	Yes	No	N/A
Laboratory blanks analyzed?	Yes	No	N/A
Laboratory blank results acceptable?	Yes	No	N/A
Field blanks analyzed? (Levels C, D, E)	Yes	No	N/A
Field blank results acceptable? (Levels C, D, E)	Yes	No	N/A
Transcription/calculation errors? (Levels D, E)	Yes	No	N/A

Comments: _____

4. ACCURACY (Levels C, D, and E)

MS/MSD samples analyzed?	Yes	No	N/A
MS/MSD results acceptable?	Yes	No	N/A
MS/MSD standards NIST traceable? (Levels D, E)	Yes	No	N/A
MS/MSD standards expired? (Levels D, E)	Yes	No	N/A
LCS/BSS samples analyzed?	Yes	No	N/A
LCS/BSS results acceptable?	Yes	No	N/A
Standards traceable? (Levels D, E)	Yes	No	N/A
Standards expired? (Levels D, E)	Yes	No	N/A
Transcription/calculation errors? (Levels D, E)	Yes	No	N/A
Performance audit sample(s) analyzed?	Yes	No	N/A
Performance audit sample results acceptable?	Yes	No	N/A

Comments: _____
no N/A

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST**5. PRECISION (Levels C, D, and E)**

Duplicate RPD values acceptable? ☒ Yes No N/A

Duplicate results acceptable? ☒ Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) Yes No ☒ N/A

MS/MSD standards expired? (Levels D, E) Yes No ☒ N/A

Field duplicate RPD values acceptable? ☒ Yes No N/A

Field split RPD values acceptable? Yes No ☒ N/A

Transcription/calculation errors? (Levels D, E) Yes No ☒ N/A

Comments: _____

6. ICP QUALITY CONTROL (Levels D and E)

ICP serial dilution samples analyzed? Yes No ☒ N/A

ICP serial dilution %D values acceptable? Yes No ☒ N/A

ICP post digestion spike required? Yes No ☒ N/A

ICP post digestion spike values acceptable? Yes No ☒ N/A

Standards traceable? Yes No ☒ N/A

Standards expired? Yes No ☒ N/A

Transcription/calculation errors? Yes No ☒ N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST**7. FURNACE AA QUALITY CONTROL (Levels D and E)**

Duplicate injections performed as required?	Yes	No	N/A
Duplicate injection %RSD values acceptable?	Yes	No	N/A
Analytical spikes performed as required?	Yes	No	N/A
Analytical spike recoveries acceptable?	Yes	No	N/A
Standards traceable?	Yes	No	N/A
Standards expired?	Yes	No	N/A
MSA performed as required?	Yes	No	N/A
MSA results acceptable?	Yes	No	N/A
Transcription/calculation errors?	Yes	No	N/A

Comments: _____

_____**8. HOLDING TIMES (all levels)**

Samples properly preserved?	Yes	No	N/A
Sample holding times acceptable?	Yes	No	N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses?.....	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A
Results supported in the raw data? (Levels D, E).....	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Samples properly prepared? (Levels D, E).....	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Detection limits meet RDL?.....	<input checked="" type="radio"/> Yes	<input type="radio"/> No	N/A
Transcription/calculation errors? (Levels D, E)	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A

Comments: _____

Appendix 6

Additional Documentation Requested by Client

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Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 03/10/06

CLIENT: TNUHANFORD RC-032 K0228
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0602L300

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	06L0117-MB1	Lead, Total	0.31	μg MG/KG	0.31	1.0

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Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 03/10/06

CLIENT: TNUHANFORD RC-032 K0228
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0602L300

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-002	J117N8	Lead, Total	49.9	3.4	49.3	94.3	2.0

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Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 03/10/06

CLIENT: TNUHANFORD RC-032 K0228
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0602L300

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
=====	=====	=====	=====	=====	=====	=====
-002REP	J117N8	Lead, Total	3.4	4.1	18.7	3.0

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Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 03/10/06

CLIENT: TNUHANFORD RC-032 K0228
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0602L300

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	SPIKED AMOUNT	UNITS	%RECOV
*****	*****	*****	*****	*****	*****	*****
LCS1	06L0117-LC1	Lead, LCS	238	250	MG/KG	95.1

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Date: 1 May 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol - Waste
Site 116-F-8 & 116-F-16
Subject: Wet Chemistry - Data Package No. K0228-LLI

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0228 prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

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J117N9	2/15/06	Soil	C	See note 1
J117P0	2/15/06	Soil	C	See note 1
J117P1	2/15/06	Soil	C	See note 1
J117P2	2/15/06	Soil	C	See note 1

1 – Chromium VI by 7196A.

Data validation was conducted in accordance with the Washington Closure Hanford (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, Rev. 4, February 2005). Appendices 1 through 6 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation
- Appendix 6. Additional Documentation Requested by Client

DATA QUALITY PARAMETERS

Holding Times

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 30 days for chromium VI.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the

000001

limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

• **Method Blanks**

Method Blanks

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. All blank results must fall below the contract required detection limit (CRQL) to be acceptable.

All method blank results were acceptable.

Field (Equipment) Blank

One field blank (J118J1) was submitted for analysis. No analytes were detected in the field blank.

• **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 70% to 130%. Samples with a recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a recovery greater than 130% and a sample result less than the IDL, no qualification is required.

All accuracy results were acceptable.

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- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J117N8/J117P2) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQLs) to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

- **Completeness**

Data package K0228 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

000003

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1
Glossary of Data Reporting Qualifiers

000005

Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2
Summary of Data Qualification

000007

WET CHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K0228	REVIEWER: TLI	PROJECT: 116-F-8 & 116-F-16	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned			

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

Project: WASHINGTON CLOSURE HANFORD																	
Lab: LLI				SDG: K0228													
Sample Number				J117N8		J117N9		J117P0		J117P1		J117P2		J118J1			
Remarks												Duplicate		E. Blank			
Sample Date				2/15/06		2/15/06		2/15/06		2/15/06		2/15/06		2/15/06			
Wet Chemistry				RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q			
Chromium VI				0.5	0.20 U		0.29		0.42		0.28		0.34		0.20 U		

0000010

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 03/06/06

CLIENT: TNU-HANFORD RC-032 K0228
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0602L300

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J118J1	% Solids Chromium VI	100 0.20 u	% MG/KG	0.01 0.20	1.0 1.0
-002	J117N8	% Solids Chromium VI	95.7 0.29	% MG/KG	0.01 0.21	1.0 1.0
-003	J117N9	% Solids Chromium VI	95.9 0.42	% MG/KG	0.01 0.21	1.0 1.0
-004	J117P0	% Solids Chromium VI	91.4 0.28	% MG/KG	0.01 0.22	1.0 1.0
-005	J117P1	% Solids Chromium VI	94.7 0.34	% MG/KG	0.01 0.21	1.0 1.0
-006	J117P2	% Solids Chromium VI	98.1 0.20 u	% MG/KG	0.01 0.20	1.0 1.0

✓
c/130/06

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000012



Analytical Report

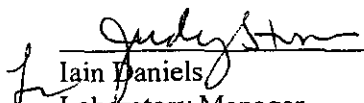
Client: TNU-HANFORD RC-032 K0228
LVL#: 0602L300

W.O.#: 11343-606-001-9999-00
Date Received: 02-17-06

INORGANIC NARRATIVE

1. This narrative covers the analyses of 6 soil samples.
2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary.

LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete list of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
3. Sample holding times as required by the method and/or contract were met.
4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy.
5. The method blank for Chromium VI was within the method criteria.
6. The Laboratory Control Samples (LCS) for Chromium VI were within the laboratory control limits.
7. The matrix spike recoveries for Chromium VI were within the 75-125% control limits.
8. The replicate analysis for Chromium VI was within the 20% Relative Percent Difference (RPD) control limit.
9. Results for solid samples are reported on a dry weight basis.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.


Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

3/24/06
Date

njpl02-300

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 14 pages.

000013

03

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-032-014		Page 1 of 1				
Collector Coffman/Stankovich		Company Contact R.T. Coffman		Telephone No. 528-6409		Project Coordinator KESSNER, JH		Price Code 86		Data Turnaround 21 days			
Project Designation 100-F Remaining Sites Burial Grounds - Soil Full Protocol		Sampling Location 116-F-16 Deep Shallow ms 2-8-06				SAF No. RC-032		Air Quality <input type="checkbox"/>					
Ice Chest No. ERC-03-103		Field Logbook No. EFL-1174		COA R16F162000		Method of Shipment FedEx							
Shipped To EDERLINE SERVICES LIONVILLE		Offsite Property No. A060290				Bill of Lading/Air Bill No. See OSPC							
POSSIBLE SAMPLE HAZARDS/REMARKS NA < DOT Limits Special Handling and/or Storage cool 4 degrees C				Preservation		None	Cool 4C	None	None	None			
				Type of Container		G/P	G/P	G/P	G/P	G/P			
				No. of Container(s)		1	1	1	1	1			
				Volume		250g	60mL	500mL	80mL	60mL			
000014 SAMPLE ANALYSIS				See item (1) in Special Instructions.		Chromium Hex - 7196	See item (2) in Special Instructions.	Nickel, Strontium, 89,90 - Total Sr	Isotopic Plutonium				
Sample No.	Matrix *	Sample Date	Sample Time										
J117N8	SOIL	2-15-08	0815	X	X								
J117N9	SOIL	2-15-08	0830	X	X								
J117P0	SOIL	2-15-08	0840	X	X								
J117P1	SOIL	2-15-08	0850	X	X								
J117P2	SOIL	2-15-08	0815	X	X								
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		ms 2/8/08 (1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7470-(CV) (2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Silver-108 metastable) Personnel not available to relinquish samples from 3728 Ref # 2C on 2/16/06					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time							
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time							
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time							
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time							
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		Matrix * S=Soil SE=Sediment SO=Solid SL=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drawn Liquids T=Tissue WI=Wipe L=Liquid V=Vegetation X=Other					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time							
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time							
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time							
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time							
LABORATORY SECTION		Received By				Title				Date/Time			
FINAL SAMPLE DISPOSITION		Disposal Method				Disposed By				Date/Time			

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-032-022		Page 1 of 1	
Collector Coffman/Stankovich		Company Contact R.T. Coffman		Telephone No. 528-6409		Project Coordinator KESSNER, JH		Price Code 8C Data Turnaround	
Project Designation 100-F Remaining Sites Burial Grounds - Soil Full Protocol		Sampling Location 116-F-16 Shallow		SAF No. RC-032		Air Quality <input type="checkbox"/> 21 days			
Ice Chest No. ERC-03-103		Field Logbook No. EFL-1174		COA R16F162000		Method of Shipment Fed Ex			
Shipped To EDERLINE SERVICES / LIONVILLE		Offsite Property No. A060290		Bill of Lading/Air Bill No. See OSPL					
POSSIBLE SAMPLE HAZARDS/REMARKS NA < POT Limits Special Handling and/or Storage Cool 4 degrees C		Preservation		None	Cool 4C	None	None	None	
		Type of Container		G/P	G/P	G/P	G/P	G/P	
		No. of Container(s)		1	1	1	1	1	
		Volume		250g	60mL	500mL	60mL	60mL	
00001 SAMPLE ANALYSIS		See item (1) in Special Instructions		Chromium Hex - 7196	See item (2) in Special Instructions	Mn-53, Sr-90 -- Total	Isotopic Plutonium		
Sample No.		Matrix *		Sample Date		Sample Time			
J118J1		SOIL		2-15-06		745		X X	
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		wa 2/15/06 (1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 9490 - (CV) (2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Silver-108 metastable) Personnel not available to Relinquish samples from 3728 Ref # 2C on 2/16/06	
MTT		2/15/06		3728/2C		2/15/06 1430			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
3728/2C		2-16-06 1130		RZ Stuffle R. J. Stuffle		2-16-06			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
RZ Stuffle R. J. Stuffle		2-16-06 1600		Fed Ex					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
Fed Ex		2-17-06 10920		W. Smith		2-17-06 10920			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
LABORATORY SECTION		Received By		Title				Date/Time	
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time	

Appendix 5
Data Validation Supporting Documentation

000016

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<u>C</u>	D	E
PROJECT: 100F 116-F-8416	DATA PACKAGE: 4/24/06 K0228				
VALIDATOR: TLT	LAB: LCD		DATE: 4/28/06		
			SDG: 4/28/06 K0228		
ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	<u>Chromium-VI</u>	pH	NO ₃ /NO ₂
Sulfate	TDS	TKN	Phosphate		
SAMPLES/MATRIX					
J117N8 J117N9 J117P0 J117P1 J117P2 J118J1					
Soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes No N/A

Comments: _____

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? Yes No N/AInitial calibrations acceptable? Yes No N/AICV and CCV checks performed on all instruments? Yes No N/AICV and CCV checks acceptable? Yes No N/AStandards traceable? Yes No N/AStandards expired? Yes No N/ACalculation check acceptable? Yes No N/A

Comments: _____

000017

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) Yes No N/A
ICB and CCB results acceptable? (Levels D, E) Yes No N/A
Laboratory blanks analyzed? Yes No N/A
Laboratory blank results acceptable? Yes No N/A
Field blanks analyzed? (Levels C, D, E) Yes No N/A
Field blank results acceptable? (Levels C, D, E) Yes No N/A
Transcription/calculation errors? (Levels D, E) Yes No N/A

Comments: _____

4. ACCURACY (Levels C, D, and E)

Spike samples analyzed? Yes No N/A
Spike recoveries acceptable? Yes No N/A
Spike standards NIST traceable? (Levels D, E) Yes No N/A
Spike standards expired? (Levels D, E) Yes No N/A
LCS/BSS samples analyzed? Yes No N/A
LCS/BSS results acceptable? Yes No N/A
Standards traceable? (Levels D, E) Yes No N/A
Standards expired? (Levels D, E) Yes No N/A
Transcription/calculation errors? (Levels D, E) Yes No N/A
Performance audit sample(s) analyzed? Yes No N/A
Performance audit sample results acceptable? Yes No N/A

Comments: NO PAS

000018

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? Yes No N/A
Duplicate results acceptable? Yes No N/A
MS/MSD standards NIST traceable? (Levels D, E) Yes No N/A
MS/MSD standards expired? (Levels D, E) Yes No N/A
Field duplicate RPD values acceptable? Yes No N/A
Field split RPD values acceptable? Yes No N/A
Transcription/calculation errors? (Levels D, E) Yes No N/A

Comments: _____

6. HOLDING TIMES (all levels)

Samples properly preserved? Yes No N/A
Sample holding times acceptable? Yes No N/A

Comments: _____

000019

GENERAL CHEMISTRY ANALYSIS DATA VALIDATION CHECKLIST

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses?.....	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
Results supported in the raw data? (Levels D, E).....	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Samples properly prepared? (Levels D, E).....	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A
Detection limits meet RDL?.....	<input checked="" type="radio"/> Yes	<input type="radio"/> No	<input type="radio"/> N/A
Transcription/calculation errors? (Levels D, E)	<input type="radio"/> Yes	<input type="radio"/> No	<input checked="" type="radio"/> N/A

Comments: _____

Appendix 6

Additional Documentation Requested by Client

000021

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 03/06/06

CLIENT: TNU-HANFORD RC-032 K0228
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0602L300

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	06LVI012-MB1	Chromium VI	0.20 u	MG/KG	0.20	1.0

000022

07

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 03/06/06

CLIENT: TNU-HANFORD RC-032 K0228
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0602L300

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	J118J1	Soluble Chromium VI	4.0	0.20u	4.0	96.4	1.0
		Insoluble Chromium VI	1080	0.20u	979	110.0	100
BLANK10	06LVI012-MB1	Soluble Chromium VI	4.0	0.20u	4.0	100.2	1.0
		Insoluble Chromium VI	1110	0.20u	1080	102.5	100

000023

08

Lionville Laboratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 03/06/06

CLIENT: TNU-HANFORD RC-032 K0228
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0602L300

SAMPLE	SITE ID	ANALYTE	SPIKE#1	SPIKE#2	%DIFF
			%RECOV	%RECOV	
-001	J118J1	Chromium VI	96.4	110.0	13.2
BLANK10	06LVI012-MB1	Chromium VI	100.2	102.5	2.3

000024

09

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 03/06/06

CLIENT: TNU-HANFORD RC-032 K0228
WORK ORDER: 11343-606-001-9999-00

IVL LOT #: 0602L300

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE RPD	DILUTION FACTOR (REP)
-----	-----	-----	-----	-----	-----
-001REP	J118J1	Chromium VI	0.20u	0.24 51.2	1.0

000025

Date: 1 May 2006
To: Washington Closure Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-F Remaining Sites Burial Grounds – Soil Full Protocol - Waste
Site 116-F-8 & 116-F-16
Subject: Radiochemistry - Data Package No. K0228-EB

INTRODUCTION

This memo presents the results of data validation on Data Package No. K0228 prepared by Eberline Services (EB). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Date
J118J1	2/15/06	Soil	C	See note 1 & 2
J117N8	2/15/06	Soil	C	See note 1
J117N9	2/15/06	Soil	C	See note 1
J117P0	2/15/06	Soil	C	See note 1
J117P1	2/15/06	Soil	C	See note 1
J117P2	2/15/06	Soil	C	See note 1

1 – Gamma spectroscopy, total strontium and alpha spectroscopy (isotopic plutonium).

2 – Nickel-63.

Data validation was conducted in accordance with the Washington Closure Hanford Incorporated (WCH) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL-96-22, February 2005). Appendices 1 through 6 provide the following information as indicated below:

- Appendix 1. Glossary of Data Reporting Qualifiers
- Appendix 2. Summary of Data Qualification
- Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
- Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
- Appendix 5. Data Validation Supporting Documentation
- Appendix 6. Additional Data Requested by Client

DATA QUALITY PARAMETERS

• Holding Times

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

All holding times were acceptable.

000001

· Preparation (Method) Blanks

Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the minimum detectable activity (MDA), the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the MDA are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

All blank results were acceptable.

Field (Equipment) Blank

One equipment blank (J118J1) was submitted for analysis. Potassium-40 was detected in the equipment blank. Under the WCH statement of work, no qualification is required.

· Accuracy

Accuracy is evaluated from laboratory control sample (LCS) or blank spike sample (BSS) batch samples and spiked samples from the analytical batch. Measured activities are compared to the known added amounts. The acceptable LCS or BSS and matrix spike (MS) recovery range is 70-130%. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, or not qualified, depending on the activity of the individual sample. Results are rejected for LCS/BSS recoveries of less than 30% and tracer recoveries of less than 20%, and tracer recoveries of greater than 115% for detected results.

All accuracy results were acceptable.

· Laboratory Duplicates

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and

000002

replicate activities (concentrations) are greater than five times the contract required detection limit (CRDL) and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All duplicate results were acceptable.

Field Duplicates

One set of field duplicates (J117N8/J117P2) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. The RPD for potassium-40(43%) was outside QC limits. Under the WCH statement of work, no qualification is required. All other field duplicate results were acceptable.

• **Detection Levels**

Reported analytical detection levels for undetected analytes are compared against the remaining waste sites RQLs to ensure that laboratory detection levels meet the required criteria. Thirty analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

• **Completeness**

Data package No. K0228 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Thirty analytes exceeded the RQL. Under the WCH statement of work, no qualification is required.

000003

REFERENCES

WCH, Contract #20266, *Validation Statement of Work*, Washington Closure Hanford Incorporated, July 7, 2003.

DOE/RL-96-22, Rev. 4, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, February 2005.

Appendix 1
Glossary of Data Reporting Qualifiers

000005

Qualifiers which may be applied by data validators in compliance with the BHI statement of work are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.
- UJ - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

000006

Appendix 2
Summary of Data Qualification

000007

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: K0228	REVIEWER: TLI	PROJECT: 116-F-8 & 116-F-16	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned			

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

Project: WASHINGTON CLOSURE HANFORD													
Laboratory: EB													
Case		SDG: K0228											
Sample Number		J117N8		J117N9		J117P0		J117P1		J117P2		J118J1	
Remarks										Duplicate		E. Blank	
Sample Date		2/15/06		2/15/06		2/15/06		2/15/06		2/15/06		2/15/06	
Radiochemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Nickel-63	30	NA		NA		NA		NA		NA		0.035	
Total Strontium	1	-0.032		-0.012		-0.028		-0.016		0.058		-0.014	
Plutonium-238	1	0		-0.065		-0.065		0		0		-0.027	
Plutonium-239/240	1	0		0.065		0		0		0		0.027	
Potassium-40		11.2		9.86		8.41		8.86		17.4		3.65	
Cobalt 60	0.05	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*
Cesium 137	0.05	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*
Radium-226		U	U	U	U	0.343		U	U	U	U	U	U
Radium-228		U	U	U	U	U	U	U	U	U	U	U	U
Europium 152	0.1	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*
Europium 154	0.1	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*
Europium 155	0.1	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*
Thorium-228		0.387		0.629		0.472		0.552		0.448		U	U
Thorium-232		U	U	U	U	U	U	U	U	U	U	U	U
Uranium-235(gea)		U	U	U	U	U	U	U	U	U	U	U	U
Uranium-238(gea)		U	U	U	U	U	U	U	U	U	U	U	U
Americium-241(gea)		U	U	U	U	U	U	U	U	U	U	U	U
Silver-108m		U	U	U	U	U	U	U	U	U	U	U	U

* - RQL exceeded

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize potential miss-interpretation of results. All other qualifiers shown were applied during validation.

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP K0228

R602124-01

J117N8

DATA SHEET

SDG <u>7390</u>	Client/Case no <u>Hanford</u>	SDG <u>K0228</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R602124-01</u>	Client sample id <u>J117N8</u>	
Dept sample id <u>7390-001</u>	Location/Matrix <u>116-F-16 Shallow</u>	<u>SOLID</u>
Received <u>02/17/06</u>	Collected/Weight <u>02/15/06 08:15</u>	<u>746 g</u>
% solids <u>96.8</u>	Custody/SAF No <u>RC-032-014</u>	<u>RC-032</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Total Strontium	SR-RAD	-0.032	0.14	0.30	1.0	U	SR
Plutonium 238	13981-16-3	0	0.092	0.35	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.092	0.35	1.0	U	PU
Potassium 40	13966-00-2	11.2	7.7	0.72			GAM
Cobalt 60	10198-40-0	U		0.10	0.050	U	GAM
Cesium 137	10045-97-3	U		0.090	0.10	U	GAM
Radium 226	13982-63-3	U		0.21	0.10	U	GAM
Radium 228	15262-20-1	U		0.75	0.20	U	GAM
Europium 152	14683-23-9	U		0.19	0.10	U	GAM
Europium 154	15585-10-1	U		0.28	0.10	U	GAM
Europium 155	14391-16-3	U		0.18	0.10	U	GAM
Thorium 228	14274-82-9	0.387	0.17	0.097			GAM
Thorium 232	TH-232	U		0.75		U	GAM
Uranium 235	15117-96-1	U		0.28		U	GAM
Uranium 238	U-238	U		11		U	GAM
Americium 241	14596-10-2	U		0.27		U	GAM
Silver 108m	14391-65-2	U		0.057		U	GAM

100F RemainsSitesBurialGrnd-SoilFullP

Handwritten: 4/30/06

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>03/14/06</u>

000011

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP K0228

R602124-02

J117N9

DATA SHEET

SDG <u>7390</u>	Client/Case no <u>Hanford</u>	SDG <u>K0228</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R602124-02</u>	Client sample id <u>J117N9</u>	
Dept sample id <u>7390-002</u>	Location/Matrix <u>116-F-16 Shallow</u>	<u>SOLID</u>
Received <u>02/17/06</u>	Collected/Weight <u>02/15/06 08:30</u>	<u>798 g</u>
% solids <u>96.0</u>	Custody/SAF No <u>RC-032-014</u>	<u>RC-032</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Total Strontium	SR-RAD	-0.012	0.14	0.29	1.0	U	SR
Plutonium 238	13981-16-3	-0.065	0.13	0.50	1.0	U	PU
Plutonium 239/240	PU-239/240	0.065	0.13	0.50	1.0	U	PU
Potassium 40	13966-00-2	9.86	1.3	0.97			GAM
Cobalt 60	10198-40-0	U		0.11	0.050	U	GAM
Cesium 137	10045-97-3	U		0.11	0.10	U	GAM
Radium 226	13982-63-3	U		0.22	0.10	U	GAM
Radium 228	15262-20-1	U		0.46	0.20	U	GAM
Europium 152	14683-23-9	U		0.32	0.10	U	GAM
Europium 154	15585-10-1	U		0.39	0.10	U	GAM
Europium 155	14391-16-3	U		0.26	0.10	U	GAM
Thorium 228	14274-82-9	0.629	0.17	0.16			GAM
Thorium 232	TH-232	U		0.46		U	GAM
Uranium 235	15117-96-1	U		0.39		U	GAM
Uranium 238	U-238	U		14		U	GAM
Americium 241	14596-10-2	U		0.23		U	GAM
Silver 108m	14391-65-2	U		0.079		U	GAM

100F RemainSitesBurialGrnd-SoilFullp

Handwritten: 4/30/06

000012

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>03/14/06</u>

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K0228

R602124-03

J117P0

DATA SHEET

SDG <u>7390</u>	Client/Case no <u>Hanford</u>	SDG <u>K0228</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R602124-03</u>	Client sample id <u>J117P0</u>	
Dept sample id <u>7390-003</u>	Location/Matrix <u>116-F-16 Shallow</u>	<u>SOLID</u>
Received <u>02/17/06</u>	Collected/Weight <u>02/15/06 08:40</u>	<u>851 g</u>
% solids <u>94.3</u>	Custody/SAF No <u>RC-032-014</u>	<u>RC-032</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Total Strontium	SR-RAD	-0.028	0.14	0.29	1.0	U	SR
Plutonium 238	13981-16-3	-0.065	0.13	0.50	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.13	0.50	1.0	U	PU
Potassium 40	13966-00-2	8.41	1.6	1.3			GAM
Cobalt 60	10198-40-0	U		0.13	0.050	U	GAM
Cesium 137	10045-97-3	U		0.11	0.10	U	GAM
Radium 226	13982-63-3	0.343	0.18	0.18	0.10		GAM
Radium 228	15262-20-1	U		0.52	0.20	U	GAM
Europium 152	14683-23-9	U		0.32	0.10	U	GAM
Europium 154	15585-10-1	U		0.40	0.10	U	GAM
Europium 155	14391-16-3	U		0.25	0.10	U	GAM
Thorium 228	14274-82-9	0.472	0.14	0.15			GAM
Thorium 232	TH-232	U		0.52		U	GAM
Uranium 235	15117-96-1	U		0.39		U	GAM
Uranium 238	U-238	U		13		U	GAM
Americium 241	14596-10-2	U		0.23		U	GAM
Silver 108m	14391-65-2	U		0.083		U	GAM

100F RemainSitesBurialGrnd-SoilFullp

Handwritten: 12 4/30/06

000013

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>03/14/06</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP K0228

R602124-04

J117P1

DATA SHEET

SDG <u>7390</u>	Client/Case no <u>Hanford</u>	SDG <u>K0228</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R602124-04</u>	Client sample id <u>J117P1</u>	
Dept sample id <u>7390-004</u>	Location/Matrix <u>116-F-16 Shallow</u>	<u>SOLID</u>
Received <u>02/17/06</u>	Collected/Weight <u>02/15/06 08:50</u>	<u>746 g</u>
% solids <u>95.1</u>	Custody/SAF No <u>RC-032-014</u>	<u>RC-032</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Total Strontium	SR-RAD	-0.016	0.16	0.32	1.0	U	SR
Plutonium 238	13981-16-3	0	0.13	0.48	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.13	0.48	1.0	U	PU
Potassium 40	13966-00-2	8.86	1.7	1.3			GAM
Cobalt 60	10198-40-0	U		0.14	0.050	U	GAM
Cesium 137	10045-97-3	U		0.13	0.10	U	GAM
Radium 226	13982-63-3	U		0.50	0.10	U	GAM
Radium 228	15262-20-1	U		0.64	0.20	U	GAM
Europium 152	14683-23-9	U		0.39	0.10	U	GAM
Europium 154	15585-10-1	U		0.44	0.10	U	GAM
Europium 155	14391-16-3	U		0.28	0.10	U	GAM
Thorium 228	14274-82-9	0.552	0.17	0.17			GAM
Thorium 232	TH-232	U		0.64		U	GAM
Uranium 235	15117-96-1	U		0.43		U	GAM
Uranium 238	U-238	U		17		U	GAM
Americium 241	14596-10-2	U		0.27		U	GAM
Silver 108m	14391-65-2	U		0.092		U	GAM

100F RemainSitesBurialGrnd-SoilFullP

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4/30/06

000014

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>03/14/06</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP K0228

R602124-05

J117P2

DATA SHEET

SDG <u>7390</u>	Client/Case no <u>Hanford</u>	SDG <u>K0228</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R602124-05</u>	Client sample id <u>J117P2</u>	
Dept sample id <u>7390-005</u>	Location/Matrix <u>116-F-16 Shallow</u>	<u>SOLID</u>
Received <u>02/17/06</u>	Collected/Weight <u>02/15/06 08:15</u>	<u>757 g</u>
% solids <u>96.8</u>	Custody/SAF No <u>RC-032-014</u>	<u>RC-032</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Total Strontium	SR-RAD	0.058	0.18	0.36	1.0	U	SR
Plutonium 238	13981-16-3	0	0.043	0.16	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.043	0.16	1.0	U	PU
Potassium 40	13966-00-2	17.4	3.1	0.84			GAM
Cobalt 60	10198-40-0	U		0.099	0.050	U	GAM
Cesium 137	10045-97-3	U		0.091	0.10	U	GAM
Radium 226	13982-63-3	U		0.48	0.10	U	GAM
Radium 228	15262-20-1	U		1.0	0.20	U	GAM
Europium 152	14683-23-9	U		0.23	0.10	U	GAM
Europium 154	15585-10-1	U		0.30	0.10	U	GAM
Europium 155	14391-16-3	U		0.26	0.10	U	GAM
Thorium 228	14274-82-9	0.448	0.13	0.15			GAM
Thorium 232	TH-232	U		1.0		U	GAM
Uranium 235	15117-96-1	U		0.33		U	GAM
Uranium 238	U-238	U		11		U	GAM
Americium 241	14596-10-2	U		0.32		U	GAM
Silver 108m	14391-65-2	U		0.063		U	GAM

100F RemainSitesBurialGrnd-SoilFull1P

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 4/30/06

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>03/14/06</u>

000015

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K0228

R602124-06

J118J1

DATA SHEET

SDG <u>7390</u>	Client/Case no <u>Hanford</u>	SDG <u>K0228</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R602124-06</u>	Client sample id <u>J118J1</u>	
Dept sample id <u>7390-006</u>	Location/Matrix <u>116-F-16 Shallow</u>	<u>SOLID</u>
Received <u>02/17/06</u>	Collected/Weight <u>02/15/06 07:45</u>	<u>908 g</u>
% solids <u>100.0</u>	Custody/SAF No <u>RC-032-022</u>	<u>RC-032</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Nickel 63	13981-37-8	0.035	1.8	3.1	30	U	NI_L
Total Strontium	SR-RAD	-0.014	0.16	0.32	1.0	U	SR
Plutonium 238	13981-16-3	-0.027	0.055	0.21	1.0	U	PU
Plutonium 239/240	PU-239/240	0.027	0.055	0.21	1.0	U	PU
Potassium 40	13966-00-2	3.65	1.1	0.60			GAM
Cobalt 60	10198-40-0	U		0.084	0.050	U	GAM
Cesium 137	10045-97-3	U		0.075	0.10	U	GAM
Radium 226	13982-63-3	U		0.37	0.10	U	GAM
Radium 228	15262-20-1	U		0.40	0.20	U	GAM
Europium 152	14683-23-9	U		0.18	0.10	U	GAM
Europium 154	15585-10-1	U		0.24	0.10	U	GAM
Europium 155	14391-16-3	U		0.18	0.10	U	GAM
Thorium 228	14274-82-9	U		0.35		U	GAM
Thorium 232	TH-232	U		0.40		U	GAM
Uranium 235	15117-96-1	U		0.29		U	GAM
Uranium 238	U-238	U		12		U	GAM
Americium 241	14596-10-2	U		0.19		U	GAM
Silver 108m	14391-65-2	U		0.053		U	GAM

100F RemainsSitesBurialGrnd-SoilFullP

✓
4/30/06

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>03/14/06</u>

DATA SHEETS

Page 6

SUMMARY DATA SECTION

Page 16

000016

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000017

Case Narrative

Page 1 of 1

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K0228 was composed of six solid (soil) samples designated under SAF No. RC-032 with a Project Designation of: 100-F Remaining Sites Burial Grounds – Soil Full Protocol.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results are transmitted to WCH via e-mail on March 14, 2006.

2.0 ANALYSIS NOTES

2.1 Nickel-63 Analysis

No problems were encountered during the course of the analyses.

2.1 Total Strontium Analysis

No problems were encountered during the course of the analyses.

2.2 Isotopic Plutonium Analysis

No problems were encountered during the course of the analyses.

2.3 Gamma Spectroscopy

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."


Melissa C. Mannion
Senior Program Manager

¹⁵
3/16/06
Date

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					RC-032-014		Page 1 of 1		
Collector Coffman/Stankovich		Company Contact R.T. Coffman		Telephone No. 528-6409 <i>K0228</i>		Project Coordinator KESSNER, JH		Price Code <i>8L</i>		Data Turnaround	
Project Designation 100-F Remaining Sites Burial Grounds - Soil Full Protocol		Sampling Location 116-F-16 <i>Deep - Shallow no 2-8-86</i>		SAF No. RC-032		Air Quality <input type="checkbox"/>		<i>21 days</i>			
Ice Chest No. <i>AFS-04-122</i>		Field Logbook No. EFL-1174		COA R16F162000		Method of Shipment FedEx					
Shipped To <i>EBERLINE SERVICES / LIONVILLE</i>		Offsite Property No. <i>A060304</i>				Bill of Lading/Air Bill No. <i>See OSLC</i>					
POSSIBLE SAMPLE HAZARDS/REMARKS <i>NA < DOT Limits</i> Special Handling and/or Storage <i>at 4 degrees C R2S 2-16-06</i> <i>None</i>		Preservation		None	Cool 4C	None	None	None			
		Type of Container		G/P	G/P	G/P	G/P	G/P			
		No. of Container(s)		1	1	1	1	1			
		Volume		250g	60mL	500mL	60mL	60mL			
SAMPLE ANALYSIS <div style="writing-mode: vertical-rl; transform: rotate(180deg); position: absolute; left: -50px; top: 0;">000019</div>		See item (1) in Special Instructions.		Chromium-7196		See item (2) in Special Instructions.		Nickel-63, Strontium-89,90 - Total Sr <i>2/8/06</i>		Isotopic Plutonium	
Sample No.		Matrix *		Sample Date		Sample Time					
J117N8		SOIL		2-15-06		0815					
J117N9		SOIL		2-15-06		0830					
J117P0		SOIL		2-15-06		0846					
J117P1		SOIL		2-15-06		0850					
J117P2		SOIL		2-15-06		0815					
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS			
Relinquished By/Removed From <i>MCC M Stankovich</i>		Date/Time <i>2/15/06 1430</i>		Received By/Stored In <i>3728/ZC</i>		Date/Time <i>2/15/06 1430</i>		<i>WA 2/8/06</i> (1) ICP Metals - 6010 (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7470 (GVA) (2) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Silver-108 metastable) Personnel not available to Relinquish samples from 3728 Ref # <i>ZC</i> on <i>2/16/06</i>			
Relinquished By/Removed From <i>3728 / ZC</i>		Date/Time <i>2-16-06 1030</i>		Received By/Stored In <i>RZ Steffler RZ Steffler</i>		Date/Time <i>2-16-06 1030</i>					
Relinquished By/Removed From <i>RZ Steffler RZ Steffler</i>		Date/Time <i>2-16-06 1600</i>		Received By/Stored In <i>Fed Ex</i>		Date/Time					
Relinquished By/Removed From <i>Fed Ex</i>		Date/Time		Received By/Stored In <i>Alex Kew</i>		Date/Time <i>2/17/06 10:00</i>					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		Matrix * S=Soil SE=Sediment SO=Solid SL=Sludge W = Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue WI=Wipe L=Liquid V=Vegetation X=Other			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
LABORATORY SECTION		Received By		Title				Date/Time			
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time			

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-032-022		Page 1 of 1			
Collector Coffman/Stankovich		Company Contact R.T. Coffman		Telephone No. 528-6409		Project Coordinator KESSNER, JH		Price Code 8C Data Turnaround			
Project Designation 100-F Remaining Sites Burial Grounds - Soil Full Protocol		Sampling Location 116-F-16 Shallow		K0228 (7390)		SAF No. RC-032		Air Quality <input type="checkbox"/> 21 days			
Ice Chest No. AFS-04-122		Field Logbook No. EFL-1174		COA R16F162000		Method of Shipment Fed Ex					
Shipped To EBERLINE SERVICES LIONVILLE		Offsite Property No. A060304		Bill of Lading/Air Bill No. See OSPC							
POSSIBLE SAMPLE HAZARDS/REMARKS NA < DOT Limits Special Handling and/or Storage Cool & dry R25 None 2-16-06				Preservation		None	Cool 4C	None	None	None	
				Type of Container		G/P	G/P	G/P	G/P	G/P	
				No. of Container(s)		1	1	1	1	1	
				Volume		250g	60mL	500mL	60mL	60mL	
SAMPLE ANALYSIS 0000020				See item (1) in Special Instructions.		Chromium - 7196	See item (2) in Special Instructions.	Nickel-63; Strontium-89,90 -- Total Sr	Isotopic Plutonium		
Sample No.	Matrix *	Sample Date	Sample Time								
J118J1	SOIL	2-15-06	745			X	K	K			
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		(1) ICP Metals - 6010 (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7470 - (CV) (2) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gamma Spec - Add-on {Silver-108 metastable} Personnel not available to relinquish samples from 3728 Ref # 2C on 2/16/06			
<i>mlk instankovich</i>		2/15/06		<i>3728/2C</i>		2/15/06 1430					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
<i>3728/2C</i>		2-16-06 1030		<i>RZ Stettin R.J. Stettin</i>		2-16-06					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
<i>RZ Stettin R.J. Stettin</i>		2-16-06 1600		<i>Fed Ex</i>							
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		Matrix * S=Soil SE=Sediment SO=Solid SL=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue WI=Wipe L=Liquid V=Vegetation X=Other			
<i>FED EX</i>				<i>flex kline</i>		2/17/06 10:00					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time					
LABORATORY SECTION		Received By		Title		Date/Time					
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time					

Appendix 5
Data Validation Supporting Documentation

000021

APPENDIX A **RADIOCHEMICAL DATA VALIDATION CHECKLIST**

VALIDATION LEVEL:	A	B	<u>C</u>	D	E
PROJECT: <u>116-F-8/16</u>			DATA PACKAGE: <u>120228</u>		
VALIDATOR: <u>TLT</u>		LAB: <u>EB</u>		DATE: <u>4/28/06</u>	
			SDG: <u>K0228</u>		
ANALYSES PERFORMED					
Gross Alpha/Beta	<u>Strontium-90</u>	Technetium-99	<u>Alpha Spectroscopy</u>	<u>Gamma Spectroscopy</u>	
Total Uranium	Radium-22	Tritium	<u>nickel-63</u>		
SAMPLES/MATRIX					
<u>J117W8 J117N9 J117P0 J117P1 J117P2 J11781</u>					

1. Completeness ☐ N/A

Technical verification forms present?..... Yes No N/A

Comments: _____

2. Initial Calibration (Levels D, E) ☒ N/A

Instruments/detectors calibrated?..... Yes No N/A

Initial calibration acceptable? Yes No N/A

Standards NIST traceable?..... Yes No N/A

Standards Expired? Yes No N/A

Calculation check acceptable? Yes No N/A

Comments: _____

000022

3. Continuing Calibration (Levels D, E)

☒ N/A

Calibration checked within required frequency? Yes No N/A

Calibration check acceptable? Yes No N/A

Calibration check standards traceable? Yes No N/A

Calibration check standards expired? Yes No N/A

Calculation check acceptable? Yes No N/A

Comments: _____

4. Background Counts (Levels D, E) ☒ N/A

Background Counts checked within required frequency? Yes No N/A

Background Counts acceptable? Yes No N/A

Calculation check acceptable? Yes No N/A

Comments: _____

5. Blanks (Levels B, C, D, E) ☐ N/A

Method blank analyzed within required frequency? Yes No N/A

Method blank results acceptable? Yes No N/A

Analytes detected in method blank? Yes No N/A

Field blank(s) analyzed? Yes No N/A

Field blank results acceptable? Yes No N/A

Analytes detected in field blank(s)? Yes No N/A

Transcription/Calculation Errors? (Levels D, E) Yes No N/A

Comments: _____

2-40 in FB

6. Laboratory Control Samples or Blank Spike Samples (Levels C, D, E) ☐ N/A

LCS /BSS analyzed within required frequency? Yes No N/A

LCS/BSS recoveries acceptable? Yes No N/A

LCS/BSS traceable? (Levels D,E) Yes No N/A

LCS/BSS expired? (Levels D,E) Yes No N/A

LCS/BSS levels correct? (Levels D,E) Yes No N/A

Transcription/Calculation Errors? (Levels D, E) Yes No N/A

Comments: _____

7. Chemical Carrier Recovery (Levels C, D, E) ☒ N/A

Chemical carrier added? Yes No N/A

Chemical recovery acceptable? Yes No N/A

Chemical carrier traceable? (Levels D, E) Yes No N/A

AB00024

Chemical carrier expired? (Levels D, E)Yes No N/A

Transcription/Calculation errors? (Levels D, E).....Yes No N/A

Comments: _____

8. Tracer Recovery (Levels C, D, E) ☐ N/A

Tracer added?.....Yes No N/A

Tracer recovery acceptable?Yes No N/A

Tracer traceable? (Levels D, E)Yes No N/A

Tracer expired? (Levels D, E).....Yes No N/A

Transcription/Calculation errors? (Levels D, E).....Yes No N/A

Comments: _____

9. Matrix Spikes (Levels C, D, E)..... ☒ N/A

Matrix spike analyzed?Yes No N/A

Spike recoveries acceptable?Yes No N/A

Spike source traceable? (Levels D, E)Yes No N/A

Spike source expired? Levels D, E).....Yes No N/A

Transcription/Calculation Errors? (Levels D, E).....Yes No N/A

Comments: _____

000025

10. Duplicates (Levels C, D, E) ☐ N/A

Duplicates Analyzed at required frequency? ☒ Yes ☐ No ☐ N/A

RPD Values Acceptable? ☒ Yes ☐ No ☐ N/A

Transcription/Calculation Errors? (Levels D, E) ☐ Yes ☒ No ☐ N/A

Comments: _____

11. Field QC Samples (Levels C, D E) ☐ N/A

Field duplicate sample(s) analyzed? ☒ Yes ☐ No ☐ N/A

Field duplicate RPD values acceptable? ☐ Yes ☒ No ☐ N/A

Field split sample(s) analyzed? ☐ Yes ☒ No ☐ N/A

Field split RPD values acceptable? ☐ Yes ☐ No ☒ N/A

Performance audit sample(s) analyzed? ☐ Yes ☒ No ☐ N/A

Performance audit sample results acceptable? ☐ Yes ☐ No ☒ N/A

Comments: _____

1240 - 437, RPD

12. Holding Times (All levels)

Are sample holding times acceptable? ☒ Yes ☐ No ☐ N/A

Comments: _____

000026

13. Results and Detection Limits (All Levels)..... ☐ N/A

Results reported for all required sample analyses?..... ☒ Yes No ☐ N/A

Results supported in raw data?(Levels D, E)..... Yes No ☒ N/A

Results Acceptable? (Levels D, E) Yes No ☒ N/A

Transcription/Calculation errors? (Levels D, E)..... Yes No ☒ N/A

MDA's meet required detection limits? Yes ☒ No ☐ N/A

Transcription/calculation errors? (Levels D, E)..... Yes No ☒ N/A

Comments: 30 over

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP K0228

R602124-08

Method Blank

METHOD BLANK

SDG <u>7390</u>	Client/Case no <u>Hanford</u>	SDG <u>K0228</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R602124-08</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7390-008</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>RC-032</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Nickel 63	13981-37-8	-0.532	1.8	3.1	30	U	NI_L
Total Strontium	SR-RAD	-0.042	0.15	0.30	1.0	U	SR
Plutonium 238	13981-16-3	0.115	0.23	0.44	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.11	0.44	1.0	U	PU
Potassium 40	13966-00-2	U		1.3		U	GAM
Cobalt 60	10198-40-0	U		0.062	0.050	U	GAM
Cesium 137	10045-97-3	U		0.067	0.10	U	GAM
Radium 226	13982-63-3	U		0.11	0.10	U	GAM
Radium 228	15262-20-1	U		0.23	0.20	U	GAM
Europium 152	14683-23-9	U		0.12	0.10	U	GAM
Europium 154	15585-10-1	U		0.18	0.10	U	GAM
Europium 155	14391-16-3	U		0.14	0.10	U	GAM
Thorium 228	14274-82-9	U		0.090		U	GAM
Thorium 232	TH-232	U		0.23		U	GAM
Uranium 235	15117-96-1	U		0.24		U	GAM
Uranium 238	U-238	U		5.7		U	GAM
Americium 241	14596-10-2	U		0.26		U	GAM
Silver 108m	14391-65-2	U		0.053		U	GAM

100F RemainSitesBurialGrnd-SoilFullP

QC-BLANK #56204

METHOD BLANKS

Page 1

SUMMARY DATA SECTION

Page 8

000029

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>03/14/06</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0228

R602124-07

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7390</u>	Client/Case no <u>Hanford</u>	SDG <u>K0228</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R602124-07</u>	Client sample id <u>Lab Control Sample</u>	
Dept sample id <u>7390-007</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>RC-032</u>	

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Nickel 63	222	7.1	3.7	30		NI_L	224	9.0	99	83-117	80-120
Total Strontium	9.46	0.56	0.26	1.0		SR	9.84	0.39	96	82-118	80-120
Plutonium 238	23.5	2.5	0.33	1.0		PU	23.8	0.95	99	82-118	80-120
Plutonium 239/240	27.9	2.9	0.23	1.0		PU	26.4	1.1	106	81-119	80-120
Cobalt 60	3.01	0.30	<u>0.12</u>	0.050		GAM	2.76	0.11	109	70-130	80-120
Cesium 137	2.87	0.24	<u>0.17</u>	0.10		GAM	2.80	0.11	102	73-127	80-120

100F RemainsSitesBurialGrnd-SoilFullP

QC-LCS #56203

LAB CONTROL SAMPLES

Page 1

SUMMARY DATA SECTION

Page 9

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>1.06</u>
Report date <u>03/14/06</u>

000030

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP K0228

R602124-09

J118J1

DUPLICATE

SDG 7390

Contact Melissa C. Mannion

DUPLICATE

Lab sample id R602124-09

Dept sample id 7390-009

% solids 100.0

ORIGINAL

Lab sample id R602124-06

Dept sample id 7390-006

Received 02/17/06

% solids 100.0

Client/Case no Hanford

SDG K0228

Contract No. 630

Client sample id J118J1

Location/Matrix 116-F-16 Shallow SOLID

Collected/Weight 02/15/06 07:45 908 g

Custody/SAF No RC-032-022 RC-032

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI- FIERS	RPD %	3σ DER TOT	σ
Nickel 63	0.385	1.8	3.0	30	U	NI_L	0.035	1.8	3.1	U	-	0.3	
Total Strontium	-0.014	0.12	0.25	1.0	U	SR	-0.014	0.16	0.32	U	-	0	
Plutonium 238	0.037	0.15	0.36	1.0	U	PU	-0.027	0.055	0.21	U	-	0.8	
Plutonium 239/240	0.075	0.075	0.29	1.0	U	PU	0.027	0.055	0.21	U	-	1.0	
Potassium 40	4.15	1.2	0.79			GAM	3.65	1.1	0.60		13	70	0.5
Cobalt 60	U		<u>0.092</u>	0.050	U	GAM	U		<u>0.084</u>	U	-	0.1	
Cesium 137	U		0.070	0.10	U	GAM	U		0.075	U	-	0.1	
Radium 226	U		<u>0.16</u>	0.10	U	GAM	U		<u>0.37</u>	U	-	1.0	
Radium 228	U		<u>0.38</u>	0.20	U	GAM	U		<u>0.40</u>	U	-	0.1	
Europium 152	U		<u>0.20</u>	0.10	U	GAM	U		<u>0.18</u>	U	-	0.1	
Europium 154	U		<u>0.25</u>	0.10	U	GAM	U		<u>0.24</u>	U	-	0.1	
Europium 155	U		<u>0.16</u>	0.10	U	GAM	U		<u>0.18</u>	U	-	0.2	
Thorium 228	U		0.20		U	GAM	U		0.35	U	-	0.7	
Thorium 232	U		0.38		U	GAM	U		0.40	U	-	0.1	
Uranium 235	U		0.25		U	GAM	U		0.29	U	-	0.2	
Uranium 238	U		9.2		U	GAM	U		12	U	-	0.4	
Americium 241	U		0.19		U	GAM	U		0.19	U	-	0	
Silver 108m	U		0.055		U	GAM	U		0.053	U	-	0.1	

100F RemainsSitesBurialGrnd-SoilFullP

QC-DUP#6 56205

DUPLICATES

Page 1

SUMMARY DATA SECTION

Page 10

Lab id EBRLNE

Protocol Hanford

Version Ver 1.0

Form DVD-DUP

Version 3.06

Report date 03/14/06

000031